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 (72) Inventor JOHANN HEINRICH SAUERESSIG



## (54) ROTARY PRINTING MACHINE

(71) We, SAUERESSIG GMBH, a body corporate organised under the Laws of Germany, of 4421 Wullen/Ahaus, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a rotary printing machine for printing on webs of material, particularly on webs of paper, plastics material or metal foil.

Rotary printing machines which have a number of superimposed printing cylinders driven by means of a common drive, are used in particular for printing multi-colour patterns on webs of material moving through the machine, each of the cylinders printing in succession a different colour or different design on the web of material as the latter passes through.

In previously proposed rotary multi-colour printing machines it has, however, been found to be a disadvantage that the speed of passage of the webs of material which are to be printed is limited, that the colours do not dry sufficiently quickly on the web of material between the successive cylinders, or that when quick-drying inks are used these dry on the printing cylinder, that a vertical pattern repeat can be adjusted only with difficulty, and that colour changes can be made only in an uneconomical manner and with long standstill times.

In contrast thereto the invention seeks to provide a rotary multicolour printing machine in which abovementioned disadvantages are reduced or eliminated which permits the use of quick-drying inks, in which the drying of inks between the sets of cylinders is possible, which is of simple construction and can be handled simply, rapidly, and dependably, in which the web of material can pass through at high speed,

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which may be adapted to permit simple adjustment of a vertical pattern repeat, and which can be used for relief printing and for gravure printing.

According to the invention there is provided a rotary multicolour printing machine for printing on a moving web of material, wherein the machine comprises two or more superimposed printing cylinders arranged to be driven by a common drive means, and wherein between two successive printing cylinders, there is provided a diversion tube for guiding the web of material outside a plane containing the axes of the superimposed printing cylinders, the or each diversion tube having a porous wall through which compressed air can be passed to form a cushion of compressed air between the web of material and the surface of the tube. The web of material can thus be guided around the diversion tube without friction and the compressed air simultaneously dries the inks applied to the web of material.

In order to accelerate the drying of the inks, air can in addition be blown from drying nozzles onto the webs of material diverted out of the printing plane, and the web of material can be brought back into the printing plane by auxiliary deflecting means, such as a roller disposed in that plane in order to pass the web to the next printing cylinder.

It is advantageous for the impression cylinders to be separately driven, and both the printing cylinders and the impression cylinders can be driven by means of compressed air motors, so that the expensive explosion-proofing of the drive motors is not required.

In order to permit the use of quick-drying inks, the printing cylinders may be gravure cylinders arranged to rotate directly inside ink ducts, the ink taken up being distributed by ink ductor rollers lying at the side of the printing cylinders which may be wiped by